TRAUMATIC SUBLUXATION OF THE HUMERUS.

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HOWEVER frequent the deformity shown in the accompanying photograph may be in the experience of those of large opportunities, I cannot find a similar illustration in medical literature.* Fifty years ago, before operative technic held the centre of the stage in surgical matters, subluxation of the humerus was a subject of considerable discussion, but under that heading there are comparatively few references exactly applicable to the case here shown—indisputably a subluxation.

Sir Astley Cooper,[1] about one hundred years ago, in his treatise on dislocations, added subluxation of the humerus to the three varieties theretofore accepted: down and inward, forward under pectoral muscle, and backward on to the dorsum of the scapula. He detailed two cases of subluxation. He writes: "I believe this is not a very rare accident and shows itself by the following marks: the head of the bone is drawn forward against the coracoid process, there is a depression opposite the back of the shoulder-joint, and the posterior one-half of the glenoid cavity is perceptible from the advance of the head of the bone; the axis of the arm is thrown inward and forward; the under motions of the limb are still capable of being performed, but its elevation is prevented by the head of the humerus striking against the coracoid process. There is an evident protuberance formed by the head of the bone in its new situation, which is felt readily to roll when the arm is rotated." He permitted a discrepancy to enter into his description, however, by citing the one dissection he had seen, of this injury, in which the head of the bone was under the coracoid process—simply an unreduced subcoracoid dislocation, a variety not then recognized.

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*The exhaustive article of J. William White on displacement of the long head of the biceps might be regarded as an exception to this statement (Am. J. Med. Sc., 1884, p. 1).

This description of a partial dislocation of the head of the humerus precipitated a controversy which has cropped out from time to time in medical literature up to 1894. There was an academic discussion of what constituted a subluxation —this we find continued even as late as an 1891 edition of Hamilton's Treatise on Fractures and Dislocations.

Malgaigne[2] marvelled that so great an anatomist as Sir Astley Cooper should make the mistake of assuming there was room for the head of the humerus between the glenoid fossa and the coracoid process. However he states that Petit, from the clinical aspects, appeared to have been disposed to admit incomplete luxation of the humerus, and that Chopart thought he had encountered one instance. Malgaigne was willing to retain the term but restricted it to subcoracoid dislocations in which the articular surface of the head of the humerus rested on the anterior glenoid border. Two such cases he had dissected; in both there was a sulcus on the head of the bone, marking the site of its contact with the glenoid border, and as in one case the autopsy was only four days after the receipt of the injury he concluded this sulcus due to the impact of the head of the bone against the glenoid border at the time of the injury. Such a sulcus then indicated a subluxation as he defined it. Sedillot[3] on the contrary believed that in all unreduced subcoracoid luxations the natural and final position of the head was in contact with the glenoid border, the sulcus resulting from long-continued pressure of the head in this new position.

Such subluxations, however, as defined by Malgaigne, are not of clinical interest because symptomatically indistinguishable from complete subcoracoid luxation.

In 1834 Laugier[4] reported a subluxation of the humerus upward and forward. The patient presented himself at the Necker Hospital with a considerable swelling of the left shoulder; the elbow could be approximated to the side of the chest, and anteroposterior movements of the arm were possible, though quite painful. Not for twelve days did this surgeon suspect it was more than a sprain; an examination at the end of that time, however, after the swelling had in a great part disappeared, revealed signs which for the first time suggested a partial displacement of the humerus. The head formed a prominence within and above, on a level with the coracoid process, behind which it was applied; between the head and the arch of the acromion there existed a depression, but little marked to the eye, yet in which could be lodged the tips of one's fingers. The axis of the arm was inclined, and slightly rotated outward on its long axis, so that the internal tuberosity of the head seemed to project in front. The most difficult movement was elevation of the arm and it was seen that this was a movement of the entire shoulder—the head resting against the coracoid process caused the scapula and clavicle to be elevated as one piece; the member was shortened 5 or 6 lines. Efforts at reduction at the end of fifteen days were without success.

Malgaigne probably allots more space to the discussion of subluxation of the humerus than any other systematic writer. Concerning Laugier's case he has this to say: "It is not rare to have in scapulaglias" ('Scapulalgies'),—an equally vague term in both English and French,—" which have become chronic, a subluxation forward and upward, which has acquired a certain importance on account of the mistakes to which it has given rise. The humeral head is elevated until it is almost in contact with the acromion, and is carried forward against the external border of the coracoid process; there is found in consequence a depression under the acromion, shortening of the arm, and limitation of its movements. It is really this condition, unless I mistake it, which Laugier has described as an incomplete upward and forward luxation, produced by traumatism."

Hamilton[6] devotes greater space to subluxation of the humerus than is found in any more recent treatise. It is possible in the following paragraph he refers to the same class of cases described by Malgaigne as chronic scapulalgies:

"The head of the humerus sometimes remains for a long time after the reduction of a dislocation has been effected, slightly advanced in its socket, so as to lead to the suspicion that it is not properly reduced. The same thing also has been noticed by me where the shoulder has been subjected to a violent wrench, but no actual dislocation has ever occurred. In either case the explanation is perhaps the same—the long head of the biceps has been broken or displaced; or when it follows a dislocation, some of the muscles inserted into the greater tuberosity have been torn from their attachments; yet the laceration of the capsule and the action of the muscles may alone be concerned in the production of this phenomenon."

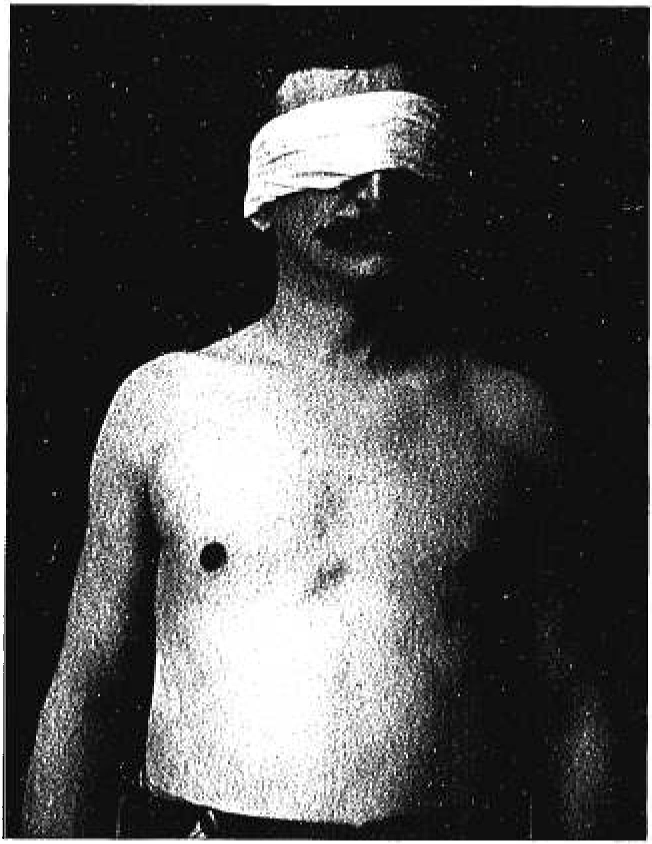
In the Centralblat fur Chirurgie, 1894, is an article by Paul Müller,[6] on traumatic subluxation of the humerus, which stands quite alone. Without much discussion of previous opinions he states simply his own: that the condition is more frequent than generally accepted. In three years he had seen five cases of omoplegia reflexa traumatica, as he would otherwise term it. The first patient consulted him on the fourteenth day after falling down several steps onto the left shoulder. There was immediate loss of the use of the arm, considerable swelling and pain. On the fourteenth day following, the patient presented himself: the elbow was supported with right hand; rotundity of shoulder was gone; the upper arm was rotated in, but a deviation of the upper arm axis from the glenoid cavity toward clavicle was not noticeable; no abnormal protrusion of the scapula; flattening of the shoulder posteriorly was plainly seen; the finger-tip could be pushed deep under the acromion process; the head of humerus was advanced about 2 cm. and closely applied against the coracoid process; the deltoid was slack. Active motion was impossible and passive motion painful; the displacement could be reduced but immediately recurred. Under chloroform there was free passive motion on replacing head; no exudate in the joint was demonstrable. The other cases were similar; the flattening of the shoulder was not at first seen, though in one case it was noted as early as the third day; this he thinks partly due to the considerable swelling but chiefly to the fact that the subluxation is a secondary circumstance. The injury produces, Müller thinks, a reflex atrophy of the deltoid, supraspinatus and usually also the infraspinatus and teres minor—which in one case were markedly atrophied—through irritation of the sensory joint branches of the axillary and suprascapular nerves—the unopposed pull of the pectoralis major, latissimus dorsi and subscapularis producing the abnormal position of the head.

A case described by Snodden[7] in 1839 is of particular interest because of the findings when it came to autopsy six months later, from other causes. This patient fell backward, receiving the weight of the body on the right elbow; the shoulder, however, sustained the entire effect of the injury. The following morning the shoulder-joint was swollen and tender to touch and painful on very slight rotation; he could not place the arm over his head, though this was possible immediately after the injury. At the end of three weeks the swelling was less, but the tenderness, and pain on certain movements, had scarcely abated at all. There was a slight flattening on outer and posterior aspects of the joint, and the head of the bone looked as if it were drawn up higher in the glenoid cavity than it should be. "The head of the bone was unduly prominent in front, almost to the amount of a partial dislocation." Abduction was limited to a very acute angle by the greater tuberosity coming in contact with the acromion. "For all useful purposes the arm was powerless—the man was unable to raise the smallest weights from the ground; otherwise, the underhand motions were not limited, the arm could be readily swung forward and backward. The locking of the humerus and acromion on abduction formed an insuperable opposition to all overhand motions." The interesting finding at autopsy six months later was the dislocation of the long head of the biceps, from its groove, without other injury. From the close resemblance of this case to partial luxation of the humerus, Snodden was led to inquire how far a lesion of this tendon is involved in the production of subluxation. But in the seventy years which have elapsed, that inquiry has not been definitely answered, for no similar clinical history has been recorded, followed by an autopsy record. Agnew[8] was among those to answer it negatively. He writes: "I have in at least three instances seen the condition present which is said to characterize this supposed displacement; and from the nature of the precedent injuries, I have been disposed to refer the anterior fulness on the inner aspect of the joint to the loss of power in the posterior scapular muscles, in consequence of which the head is drawn unusually inward by the subscapularis, and inward and upward by the clavicular fibres of the pectoralis major and deltoid muscles, and likewise, though in less degree, by the coracobrachialis and short tendon of the biceps."

After the report of Snodden's case, in the discussion of subluxation was incorporated renewed speculation as to the part played by the long head of the biceps in maintaining the head in its normal position and the symptoms resulting from its rupture or dislocation. This aspect of the discussion was based chiefly upon dissecting-room findings. Many different opinions were expressed: some that partial dislocation forward was due to rupture or dislocation of the long head of the biceps[9]; some that luxation of the long head of the biceps does not occur at all and cases so described are really instances of inflammatory swelling of the subdeltoid bursa[10] (Codman, Bost. Med. & Surg., May 31, 1906, recently called attention to the disability produced by inflammation of this bursa); some that the changes noted were the result of rheumatoid arthritis, etc., *i.e.,* that the luxation was pathological and not traumatic.

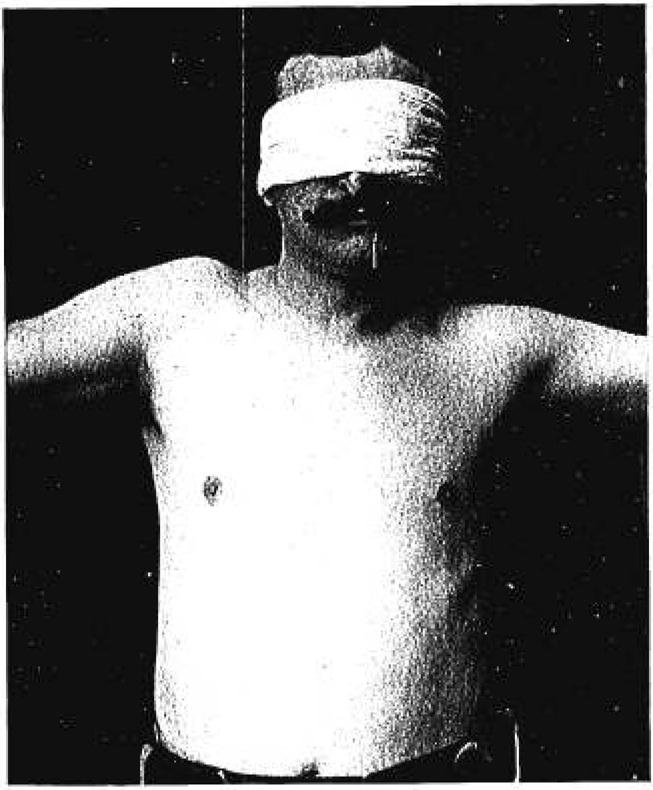
The subject of the accompanying photographs received this injury in a fall from his bicycle, on to the outstretched hand. It was regarded and treated as a sprain; all redness and swelling subsided in two or three days. Voluntary motion was abolished at first, but the next morning after a little massage some motion was possible. At the time of my first examination, seven and a half weeks after the accident, the use of the arm was so painful and limited he had not been able to return to his work as a plate printer. The under motions of the arm anteriorly were

FIG. 1.



Traumatic subluxation of the humerus.

FIG. 2.



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unrestricted, but not so posteriorly. The greatest difficulty, however, was in raising the arm beyond the horizontal; extending the arm in front, if assisted beyond the horizontal he could continue to raise the arm to the perpendicular, and voluntary movements again became freer. On comparing the two shoulders it was readily noted that the head of the humerus on the injured side was more prominent anteriorly, and on a higher level (Fig. 1).* A corresponding flatness posteriorly was not so noticeable. On extending the arms laterally to the horizontal, the deformity shown in the second photograph (Fig. 2) immediately attracted attention; the greater tuberosity seemed to lock against the acromion process, impeding further independent movement of the humerus, beyond the horizontal. An X-ray negative showed there was no injury to the bony structure. Six months later the deformity had entirely disappeared and though the functional restoration was not perfect it was nearly so.

I had advised the patient he would probably recover the use of his arm in six months or a year, but having in mind the part the long head of the biceps was said by some to play in such cases, I thought possibly his convalescence might be shortened by an effort to repair that tendon, if ruptured. He sought other advice and decided against any operative interference, and I lost the opportunity of throwing some light on the pathology of this subluxation. One dissection convinced me a study of dissecting room material would not enable me to add anything to the contributions already made from such sources, and that an autopsy *in vivo* would alone clear it up.

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[4] Laugier. Archiv. Generales de Med., 2 Ser., 1834, vol. v, p. 65.
[5] Hamilton. Fractures and Dislocations; 1891 Edition of Stephen Smith, p. 612.
[6] Müller. Centralblat fur Chir., 1894, p. 993.
[7] Snodden. Med.-Chir. Tr., vol. xxiv, p. 212.
[8] Agnew. Principles and Practice of Surgery, 1881, vol. ii, p. 55.

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* The subluxation of the acromial end of the clavicle, readily seen in the first photograph, seemingly played no part in his disability.

[9] Calloway. Jacksonian Prize Essay on Shoulder-Joint, 1849.
[10] Jarjavy. Gaz. Hebd. de Med. et de Chir., June 7, 1876, p. 357.

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